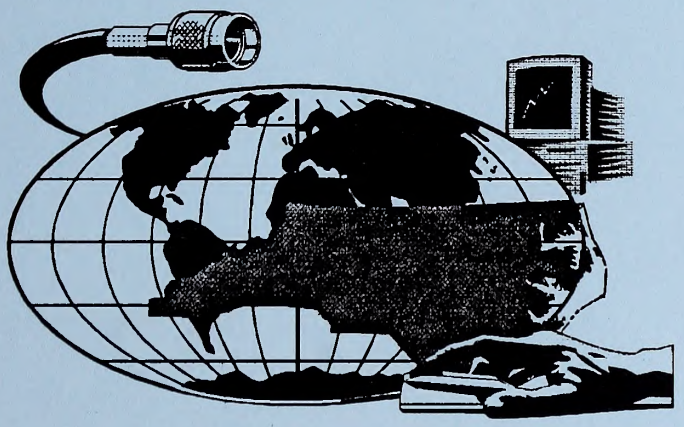
IRMT REVIEW AND RECOMMENDATIONS FOR DEHNR INFORMATION TECHNOLOGY MANAGEMENT

VOLUME III - REFERENCES AND TECHNICAL APPENDICES



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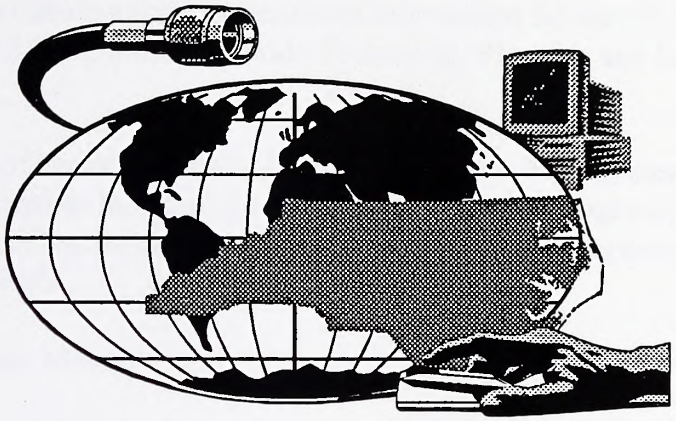
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North Carolina Department of Environment, Health, and Natural Resources
James B. Hunt, Governor
Jonathan B. Howes, Secretary

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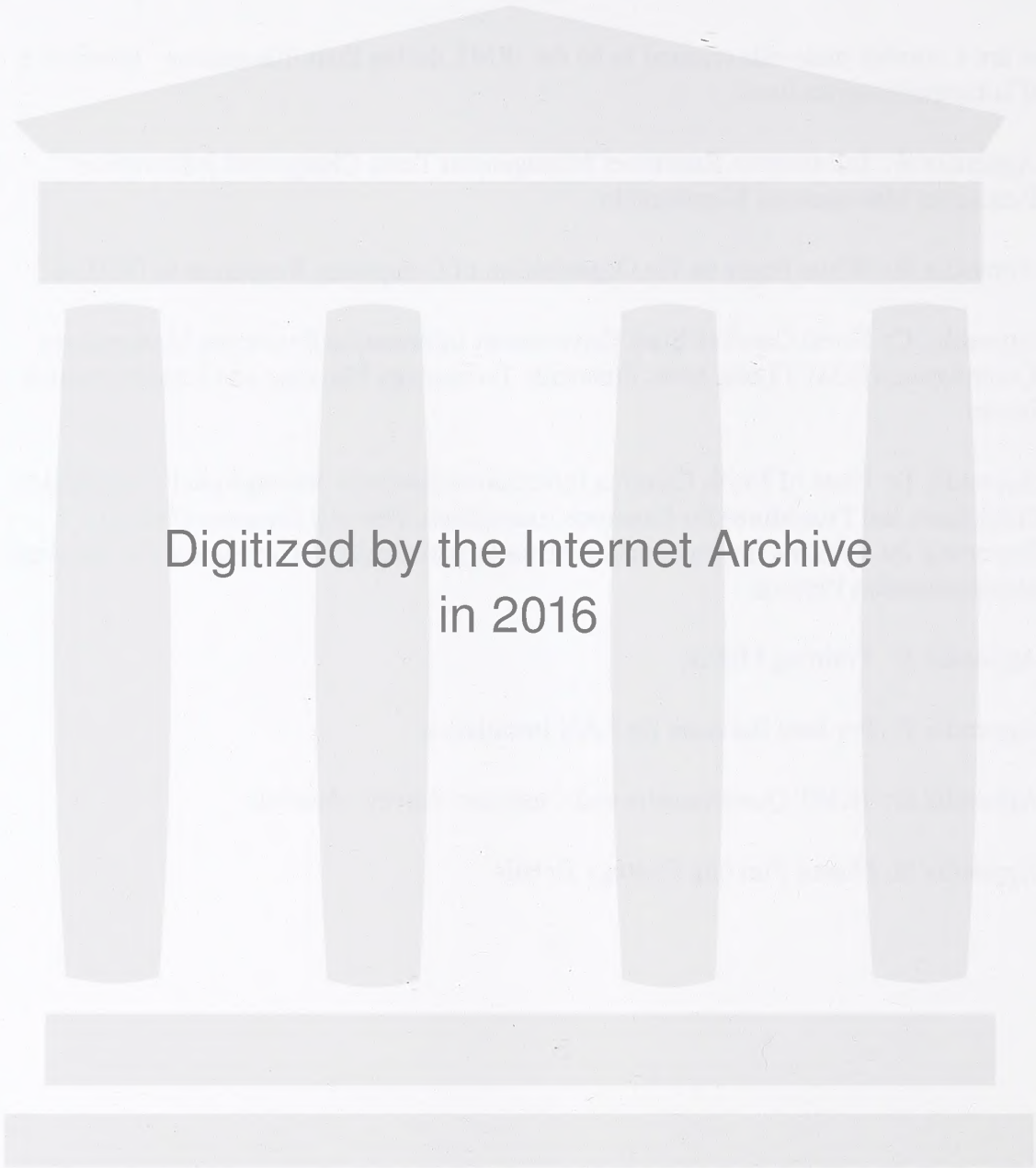
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VOLUME III

REFERENCE AND TECHNICAL APPENDICES

Enclosed are a number materials referred to by the IRMT during their discussions. Below is a listing of subsequent appendices:

- Appendix A: Information Resources Management Team Charge and Information Resources Management Membership
- Appendix B: White Paper on the Organization of Computing Resources in DEHNR
- Appendix C: North Carolina State Government Information Resources Management Commission (IRMC) Long-term, Statewide Technology Planning and Implementation Issues
- Appendix D: State of North Carolina Information Resource Management Commission Guidelines and Procedures for Resource Acquisition, Periodic Progress (Status) Reporting for Systems Implementation Projects, and Quality Management for Systems Implementation Projects
- Appendix E: Training Matrix
- Appendix F: Per Seat Estimate for LAN Installation
- Appendix G: IRMT Questionnaire and Customer Survey Materials
- Appendix H: Phased Funding Strategy Details



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APPENDIX A

Information Resources Management Team Charge and Information Resources Management Team Members

Information Resources Management Team Charge

Composition

The Information Resource Technology Team (IRMT) will be comprised of the Assistant Secretary for Administration, two members from the Administrative Divisions, two members from the Health divisions, two members from the Environmental Protection Divisions, two members from the Natural Resource divisions, and two members from the Regional Offices. The Deputy Secretary and the General Counsel will serve as ex officio members. A representative from the Office of State Controller/ Information Resource Management staff will serve as an ex officio member. The Team will be staffed by the Director of the Division of Computer Systems.

Responsibility

The IRMT will serve in an advisory capacity to senior management and to the Director of the Division of computer Systems. Working within the framework of total quality management, the IRMT will seek to do the following:

- Develop and provide oversight for all departmental information technology related policies and procedures, to include setting standards for hardware and software.
- Provide DEHNR senior management with periodic reports on the status on information technology in the Department.
- Recommend to DEHNR senior management changes in the strategic direction of the Division of computer systems, including organizational structure, technology, and staffing patterns to best serve the needs of the Department.
- Assist the Director of the Division of Computer Systems in gathering feedback from users that will improve efficiency and effectiveness of information technology and enhance customer satisfaction.
- Develop a communication's strategy for conveying the actions and recommendations of the IRMT to the Department.
- Review the implications of global positioning and GIS for the Department and make recommendations to senior staff.

IRMT MEMBERS

Lois Artis-Murray	Assistant Secretary	Administration
Delton Atkinson	Director	State Center for Health and Environmental Statistics
Karen Boulding	Manager, Training & Development	Division of Personnel/ Human Resources
Jay Brinkley	Information Systems Manager	Division of Laboratory Services
Michael G. Bryant	Purchasing Officer	Division of General Services
Louise Coats	Information Systems Manager	Division of Forest Resources
Tom Fransen	Section Chief	Hydrology & Management, Division of Water Resources
Mark Griffith	Computing Consultant III	Wilmington Regional Office
John L. Holley, Jr.	Regional Engineer	Land Quality Section, Division of Land Resources
Steve E. Martin	Deputy Director	Division of Epidemiology
Randy Moody	Interim Director	Division of Computer Systems

APPENDIX B

White Paper on the Organization of Computing Resources in DEHNR

White Paper on the Organization of Computing Resources in DEHNR

Introduction

DEHNR is a complex organization with divisions that have specialized, highly technical roles. Many of these divisions have considerable contact with the public. They are also responsible for the execution of legislation and executive orders that are highly visible and potentially controversial or volatile. A key, strategic factor in enhancing staff productivity and in the successful execution of divisional responsibilities is the processing of and access to timely, reliable information. In turn, such access can only occur when information technology (IT) resources are well coordinated and adequately funded.

DEHNR IT resources, originally housed in some of the larger divisions, have been largely centralized and are now located in a single administrative division, the Division of Computer Systems (DCS). Centralization of the IT function occurred for a number of reasons. First, the department needed a central contact point for other state agencies like SIPS. A single unit could potentially provide better service to DEHNR as a whole which has a number of smaller divisions without computing resources. The centralized organization would enable central systems support for networking and telephony, and foster comparable, high level training for the entire IT staff. This centralized staff would also be of sufficient size to provide career advancement opportunities. Clearly a number of compelling reasons fostered the reorganization.

Unfortunately, underlying this reorganization is the assumption that resources originally assigned to the different divisions would, when brought together, be sufficient to cover the needs of the entire department. This was not the case in 1989 and with the loss of a position since then, is not the case now. The hoped for outcomes have only been partially realized, and as a result, considerable dissatisfaction currently exists among both IT staff and many of the program personnel.

Program personnel are facing significant increases in their information workload with new legislation and increasing public expectations. These pressures dictate that existing systems are well-supported, and that new state-of-the-art systems be brought on line in a timely fashion. DCS personnel recognize these pressures and have been working very hard to respond, but they are badly understaffed and lack many of the support resources (e.g. training and being fully networked) that they need to respond effectively. Thus both parties are frustrated and, although all parties are making conscientious efforts, concern is widespread that a major, visible application or more general system breakdown could occur as a result.

The following white paper is a first step in a larger effort to address these problems. The objective of this paper is to review the current role of DCS in the current resource constrained environment and develop a set of recommendations that may address some of the current problems and set the stage for further resolution in the future.

To develop this white paper, all DCS personnel, many program representatives, several senior DEHNR administrators, and senior representatives from SIPS and the IRMC were interviewed. A preliminary set of questions was developed to provide a base of information for comparative purposes. Additional questions were developed based on initial discussions, and opportunities for open-ended discussions were also provided. In addition, a number of documents were reviewed including: the KPMG, Performance Audit of Information Technology and Telecommunications, the SIPS Business Plan, the DCS IRMC plan, and memoranda from DCS regarding current systems support responsibilities. Finally, organization charts and IT staffing reports were provided by various DEHNR administrative units.

Overview

The Computing Environment and Existing DCS Resources

The DEHNR computing environment is large, complex, and relatively antiquated. DEHNR has roughly one hundred legacy applications which currently reside on the SIPS ES9000 mainframe. Of these, about seventy are associated with environmental programs; twenty-five support health programs, and the remainder provide support for natural resources and administrative functions. Examples of important systems supported by DCS programmers are the: Birth Certification System, Vital Statistics System, Immunization School Survey System, Tuberculosis Control Assessment System, Contract Data System, Claims Budget System, Restaurant System, and the Disaster Recovery Files Systems. Most of the legacy systems are at least ten years old, are not well documented, and are time-consuming to maintain.

DEHNR houses several mini computers including two IBM Systems 36s, two WANGs, a DEC VAX and a Data General mini computer. These are all old platforms and as such require greater maintenance and are generally suspect in terms of their reliability. DEHNR divisions own about two thousand PCs. Of these, roughly seven hundred are LAN networked, and twenty-one of the LANs are connected via the state's WAN. Others are connected directly to the SIPS mainframe via 3270 emulation. In addition, DEHNR and the county health departments have over 2500 SNA nodes connected to the SIPS mainframe.

In summary this computer environment is highly heterogeneous with old platforms and

applications. It is characterized by complex networking requirements both in kind and number of connections, and finally it is an environment that crosses many organizational and physical boundaries. Such an environment requires considerable support resources. The heterogeneous platforms and applications greatly expand the set of skills necessary to maintain them. The age of the platforms and the outdated programming languages require programmers to spend the bulk of their time on maintenance, and the large and rapidly growing number of connections exacerbate network complexity and problem solving.

The principle responsibility for support of this DEHNR computing environment rests with DCS. (SIPS is contracted to provide application support, and larger divisions have some permanent IT resources. A number of contract programmers have also been hired primarily by other divisions to provide additional development and maintenance support.) Unfortunately the resources committed to DCS are relatively small. DCS expenditures for FY93/94 were about $1.5m. Of this total, $1.3m was spent on salaries, $.10m on processing, and $.10m on equipment purchase and maintenance. Currently DCS has twenty-three positions. Three are primarily administrative positions. Fifteen are analyst/programmers, and the remainder are computing systems and telephony support staff. The DCS programmers are trained primarily in COBOL/2 and work with IMS or VSAM databases/files. A few of the programmer/analysts have trained themselves in fourth generation languages like FOCUS and in the use of CASE tools for application development. The system support personnel provide networking support primarily for Ethernet networks with Novell network operating systems. They also support WAN access with the installation and maintenance of various routers and bridges. Finally, the systems support staff assist in installation and support of commonly used applications like e-mail, spreadsheets, and wordprocessors. Clearly the resources available to DCS are constrained. Even from this cursory overview, it is clear that current DCS staffing levels are taxed to the limit to simply maintain the existing systems.

At the same time, DEHNR computing users' needs and expectations are increasing dramatically as their "customers" expect more and as computing technology changes at an almost breathtaking pace . The latest IRM plan for DEHNR includes worthwhile requests that could easily double the current development and maintenance workload of DCS. As examples, the Division of Land Resources would like to digitize it topographical data and access the GIS corporate database. The Zoo proposes the creation of a park-wide information technology network. The Division of Solid Waste Management wants to upgrade its voice and electronic communications systems. The Division of Environmental Health seeks to provide on-line access to sample/analysis and compliance data.

All of these requests and many others, stem from ever increasing demands of the public and legislature and from a better informed group of DEHNR users who see the changes in technology - a distributed environment, object-oriented databases, workflow and workgroup software, inexpensive imaging - and know what's possible.

IT Issues:

A number of significant issues have emerged as a result of this basic, pronounced imbalance between program needs/expectations and DCS resources. Most importantly, users have reported service bottlenecks across the board – in application development, equipment and software purchasing, LAN and WAN support, password administration, and the processing of administrative paperwork. These bottlenecks and the pressures experienced by program areas, have led a number of divisions to either establish or plan to establish IT functions within their areas. Several divisions have also hired contractors to develop and maintain applications. In turn, such suboptimization has exacerbated problems of coordination and ironically, has increased the demands for support from DCS. In addition, DCS has become largely reactive with little time to anticipate changes in user requirements or to prepare for changing technologies. In conjunction with rapid turnover in DCS leadership, this reactive posture has inhibited DCS from clearly defining its role as a unit or the roles of its individual staff members.

Program staff indicate that well-intentioned promises regarding application development have been made but haven't been kept, leaving staff members skeptical and very frustrated. The delays are substantial for a significant number of programs and sections. In some cases, programs have been waiting years for hoped-for applications. A section representative noted that he has had the money to develop an externally mandated application since 1990. He made his request through formal channels and has included his request in the department's IRM plan. Yet he has had no support. At this point he is concerned that his section will be unable to process permits that should be issued in the near future. Others have attempted to develop their own applications. One individual developed a registrations and billing database that requires 500 pages of code. The program has grown so large that he can no longer support it, and he has been unable to secure DCS support or hire a contractor. His division is small and relies heavily on this database. Glitches in the application thus have a significant impact on staff productivity. His experience appears to be a common one for other small divisions whose jobs are often sandwiched between the work of larger units and programs.

Networking is a rapidly expanding aspect of computing. Many of the requests in the IRM plan are network related. However DCS has only four staff members who are charged to support one or more of the different aspects of networking (e.g. network operating systems,

wiring, routers and bridges, application installations). Again, given limited support resources, many programs have dedicated members of their staff, some of whom are not well-qualified, to LAN installation and support. They pay for expensive external consultants, or they continue to operate with stand alone computers. Often these installations have been undertaken without any consultation with DCS. In some cases, these installations have worked well, but in many others, they have not been set up to optimize functionality, ease of maintenance, or standard naming conventions. Many of these solutions have resulted either in greater expense or loss of productivity and more frustration on the part of division staff.

Overall the overwhelming demands on limited resources have placed DCS as a division and individual DCS staff members in a reactive rather than proactive position. For example, one program respondent noted that the department is implementing a new EDS accounting package in the near future, yet he has not been notified about hardware (e.g. PC vs 3270 terminal) or connectivity requirements. Another respondent is a member of an HSIS user group. He indicated that no DCS representative has participated in any of the group discussions. Clearly DCS staff members recognize the value of such conversations. They simply haven't the time to participate and consequently, to get a better understanding of user needs beyond certain specific application requirements.

Programmer analysts are regularly approached by division staff to assist not only in the maintenance of programs, but also in the installation and maintenance of LANs, the provision of technical advice on new hardware and software, and the installation of software applications and maintenance of PC's. The job description of a programmer/analyst doesn't include any of these responsibilities. Although some programmers have developed skills in these areas, there is no reason to expect them to be expert, and they are being drawn away from their primary responsibilities.

More generally, the scarcity of computing resources in DCS predisposes division personnel to trade on personal relationships with DCS staff. Rather than submit requests through formal channels, division personnel make requests of individual programmers and system support staff. This is certainly understandable, but it leads to significant problems of coordination and prioritization. Further, with regard to HSIS applications in particular, a number of applications are loosely integrated. Thus, if changes are made in one application on an ad hoc basis, they can cause unanticipated problems in others. For example, a significant number of county health department systems are not maintained by the State but are proprietary. Data is transferred back and forth in batch feeds. Changes in some program formats can disrupt these feeds. When the modifications are made on a personal, ad hoc basis, it is much more difficult to anticipate these interactions. Overall, efforts to circumvent the formal channels create a self-perpetuating cycle where those who

go through formal channels have to wait even longer and are further tempted to go informally through personal channels.

DCS staff have very limited opportunities for training. (Less than $9000 is spent annually on training in a $1.5m budget - .06% of the budget.). As such, they are not well positioned to identify and evaluate new technologies. They are in a constrained position either as advisors to recommend new technologies to other divisions or to plan ahead to prepare for the new technologies themselves.

In summary, that the DCS is understaffed places them in a largely reactive position and fosters suboptimizing behaviors by other DEHNR divisions. When divisions hire contractors or create systems internally, they may create problems with the pass off of applications to DCS. They discourage effective integration of applications as naming conventions, platforms, etc. become more heterogeneous. Network problem resolution becomes much more complex and time consuming. Some programmer analysts are pulled from one set of responsibilities to another sometimes leaving applications unfinished for months at time. Finally, DCS is too busy to create standards and monitor adherence. In the current environment where standard policies and procedures aren't followed, problems associated with limited resources are exacerbated further by suboptimizing behavior which, in turn, leads to increased demands on DCS with a corresponding increase in frustration.

Recommendations

The key question is how can DCS, in a resource constrained environment, organize its resources to provide better, more timely service to DEHNR divisions. To respond to this question, any reorganization must result in a more narrowly focused, clearly communicated set of DCS responsibilities and, if possible, should foster additional resources for IT in the larger department and for DCS in particular. The following recommendations respond to both the general need to better focus limited resources and to individual issues raised in the earlier section.

Standards and Priority Setting

I. A. Establish a standing Information Resource Management Team (IRM) that would meet on a regular, perhaps monthly basis. This group would be composed of respresentatives from the major DEHNR divisions, would be chaired by the Assistant Secretary for Administration, would report regularly to DEHNR senior management with informational updates and recommendations for review and approval.The DCS director would staff the group, and the Deputy Secretary would be an ex officio member. This team, with STRONG backing from senior

management would be responsible for developing and enforcing all IT related policies and procedures.

!. B. The Deputy Secretary and Director of DCS should represent DEHNR at IRMC and selected SIPS meetings.

I. C. DCS should establish user groups from DEHNR divisions to provide suggestions and feedback on the application of policies and procedures.

If any reorganization is to be effective, it must be executed in a context where applications and systems are installed, developed, and maintained subject to departmental standard policies and procedures. Otherwise, islands of automation will characterize the department where different divisions have different platforms, applications, naming conventions, networks, etc. and access to information from one island to the next will be difficult if not impossible.

In part, the development and application of such policies and procedures will be the responsibility of the new Director; however, by itself, DCS does not have the authority to enforce these policies. Support from the most senior administrators will be necessary to effectively enforce the such standards. Recommendation I.A is intended to bring this team together, to establish a forum for discussion, to keep senior administrators well-informed about IT related issues, and to ensure enforcement.

In addition, IRMC and SIPS are agencies that are charged with the development of state-wide IT policy standards. To some degree, DEHNR must simply accept their mandates. However, many of the other departments are fully represented in these forums by their most senior administrators, and these administrators have a significant impact on the final decisions. DEHNR should be comparably represented, relaying information back and forth.

Finally, regardless of the good intentions and preparation, policies can have unintended impacts. A mechanism should be in place that provides decision-makers with a formal mechanism for feedback and corrective action. Recommendation I.C. intends to provide this mechanism.

Applications Development and Maintenance

II. A. The applications group should no longer be housed entirely in DCS. A number of programmers and analysts should be moved out physically to the larger divisions. Their respective position budgets should also go with them. At the same time, their performance should continue to be evaluated by the DCS Director. A core of

smaller divisions which can not afford applications staff but have needs for application development and maintenance, and 2) to provide quality control for divisional application development. These programmer/analysts would become experts in a standard development methodology (e.g. the Anderson Methodology) and assure that this method is used consistently across the divisions. This unit would also be the contact for the IRMC and for SIPS. Finally, regular formal and informal opportunities (e.g. brown bag lunches, e-mail access, meetings) should be provided such that programmer/analysts can continue to benefit from one another's experiences.

II. B. The specific location (i.e. whether at the division or section level) and the specific assignment of individual programmers and analysts would be determined by senior DEHNR management in response to recommendations developed by the IRM team. Currently, most programmers and analysts are associated with specific applications. Many of the programmers have worked on a selected set of applications for a number of years and are very familiar with the logic and idiosyncrasies of the programs. Given that many of the applications were written before structured programming was widely practiced and given limited documentation for many of the applications, this familiarity is very important and should be an important criteria in determining programmer/analyst assignments.

This recommendation is made for two basic reasons. First, it is common knowledge that administrative divisions have a very difficult time securing incremental funding. This is particularly true for DCS which has experienced a reduction in positions over the last few years. Programs, on the other hand, are more likely to receive additional appropriations from the legislature, and many have access to grants from external agencies or can charge fees. Further, a number of divisions are already paying contractors to help with applications. In many cases, these contractors are more highly paid than permanent employees. Over time, incremental revenues and budgeted funds currently dedicated to contractors could be applied to a permanent division applications staff. Funding could be used to support salaries, the purchase of necessary hardware and software, and training.

Second, in the current situation, it is clear that both DCS and division staff are often frustrated. As noted above, programmers/analysts are often pulled in many directions, not only to assist with different applications but also to help with other IT related problems. Further, DCS programmer/analysts have few opportunities to either formally or informally anticipate divisional/programmatic application needs. Moving to a division would dedicate a programmer/analyst to the needs of that division/section. The programmer would have the opportunity to discuss issues with division personnel on a regular, informal basis. In so doing, he or she would be able to better identify needs and make recommendations to

division management. Moreover, division management could be sure that their priorities are the ones being addressed. To the degree that all division applications can not be addressed, it is the prerogative of division management rather than of DCS to determine priorities. This change in the decision-making locus should, in itself, alleviate some of the current frustration.

The DCS Director would continue to evaluate performance for a number of reasons. First, he or she is better able to assess the performance of these positions which require specific technical skill sets. Second, the DCS Director would also better understand the direction in which technology is moving and can determine appropriate training requirements. Finally, that the programmer/analyst is evaluated by the DCS Director encourages adherence to policies that are mandated by the IRMC, and therefore discourages the possibility of audits and sanctions for lack of adherence. In short, the DCS Director would determine that programmer/analysts across divisions would use a common development methodology, and the division director would assign the development priorties.

Importantly, this arrangement requires regular communication between the DCS and division directors. For example, the DCS Director would identify and recommend programmer/analyst training. The division director would then need to provide funding for this training. In turn, the DCS Director would honor the development priorities of the division/section directors.

In general, divisions have seen their IT staff pulled into a central administrative division. At the same time, they have experienced a marked reduction in IT support. Given this experience they have been unwilling to contribute resources beyond certain application-specific resources to DCS. This recommendation attempts to address these concerns and encourage closer, more responsive collaboration between division management and application staff.

Network/Telephony Support

III. A. Wide Area Network administration, deep LAN support, and telephony should remain in DCS.

III. B. Telephony support and networking support should be brought together under a single manager within DCS.

III. C. LAN support in the divisions and regional offices should remain physically located in those offices but should report to the DCS director.

These recommendations are intended to foster close coordination and collaboration by different network support providers while maintaining a physical presence that is responsive to site-specific needs and breakdowns. Telephony and WAN administration requires coordination across units because associated technologies provide services which cut across organizational and physical boundaries. For example, a bridge will usually connect several divisions often in different locations. Such things as compatible infrastructure and protocals are essential if these boundaries are to be effectively crossed, and a central administrative unit can better assure this compatibility.

Digital networking and telephony have many common installation and maintenance issues. At the same time, technologies with both are changing rapidly, in many cases converging. Given the fact that these technologies are in flux, different well-reasoned recommendations can be developed in response to a division's request regarding communications technology. If the division's representative receives different advice from different units within DCS, he or she will usually leave confused and uncertain about he best course of action. With both networking and telephony support reporting to the same manager, differing responses, incompatible installations, etc. can be minimized. Personnel in the same unit, could develop a common set of recommendations or actions for such things as wiring and network topologies.

Deep LAN support and perhaps some regular networking classes should be provided centrally for on-site LAN administrators. It is apparent that these administrators vary markedly in both their ability and in their training. In many cases, operational managers underestimate the skills necessary to effectively setup and manage a network of any size. As a result, they sometimes assign staff to LAN administration who are not up to the job. And even for those who are well-skilled, problems can crop up that are beyond their general level of competence. This central resource could help ameliorate problems associated with the variation in skills and provide answers to complex networking problems.

Finally, LANs have become key in the day-to-day operations of many DENHR sections. Often, work stops when the LAN goes down. This critical role thus requires that someone be on-site to respond quickly in the event of a breakdown. At the same time, the actual setup of a LAN (e.g. file naming, directory structures) must often be coordinated to assure the effective operation of applications that rely on files located at different sites and on different LANs. In addition, any LAN administrator should be expected to follow a number of good, standard practices (e.g. following regular, timely backup procedures). Under the current fragmented organization, both setups and practices vary substantially thereby increasing application maintenance efforts and placing important, sometime mission critical data, at risk. Recommendation III.C. is intended to address these concerns.

Other DCS services

IV. A. DCS should establish a data administration function. At a minimum, a data base administrator should be hired who has strong DBMS skills, good data modeling skills, and is sensitive to the political realities of such a position.

IV. B. Systems security should continue to be housed in DCS. However, procedures for password administration should be reviewed, and some responsibilities may be passed to divisions.

IV. C. DCS should establish a help desk that has two principle responsibilities: 1) to act as a clearing house for DEHNR divisions' computer users. This help desk would be a single point of contact for all inquires and would direct inquiries to the appropriate people in DCS, SIPS, or to IT personnel in the operating divisions; and 2) to provide deep support for IT personnel in the divisions.

IV. D. DCS should establish a planning/training coordinator function. An existing DCS staff member might be assigned to this on a half-time basis. This function would evaluate changing technologies, make recommendations to the Director about DCS positioning and adoption of new technologies, and develop the IRMC plan. This function would also determine DCS (and where desired, divisional programmer/analyst) training requirements, and coordinate with SIPS and other vendors to provide classes.

IV. E. DCS would provide a DEHNR disaster recovery function which would coordinate with the SIPS disaster recovery function.

Recommendations IV. A, B, C, and E all address functions where, through a centralization of services, redundancies can be reduced and information can be more readily secured and accessed by authorized individuals across the department. Effective data administration is essential to acquire and store relevant data and to retrieve that data and assure accurate, reliable reporting. A central site for security supports appropriate access to authorized individuals across departmental applications and systems using a single password. A help desk as a central contact assures that departmental requests are correctly routed to all the

appropriate support people, and a central disaster recovery function assures that all critical information and applications are saved regardless of the practices of individual divisions or programs. The planning/training function would enable DCS and IT people in other divisions to better anticipate and perpare for rapidly changing technologies. It would also satisfy requirements of other state agencies like the IRMC.

Conclusion

Critical to the success of DCS is the support of the senior DEHNR management from the Secretary to the Assistant Secretaries. They must give the DCS Director a clear understanding of their expectations and provide forums for regular updates on computing issues. To do this, the DEHNR senior management must have a basic understanding of strategic IT management issues. With this in mind, it would be very useful for senior management to receive a course that gives an overview of these issues. A number of good courses are available and can be provided off site or in house. Training and new staff will be necessary to provide the functions recommended above. Finally, a commonly cited complaint is the time taken to process administrative paperwork. Senior leadership might initiate a paperwork review for IT processing to identify opportunities to streamline administrative information requests.

APPENDIX C

North Carolina State Government Information Resources Management Commission (IRMC) Long-term, Statewide Technology Planning and Implementation Issues

North Carolina State Government Information Resources Management Commission (IRMC)
Long-term, Statewide Technology Planning and Implementation Issues

Major Observation

The state generally is not prepared to implement satisfactorily large-scale information technology projects on a consistent basis, whether internally developed or externally contracted. If the IRMC is to serve the leadership position for information technology and telecommunications articulated in its enabling legislation, it must focus state government's attention on the issues described below.

Background

This conclusion is reached as a result of (a) reviewing the status of major systems implementation efforts through the IRMC's ongoing periodic project reporting procedures, (b) evaluating agency biennial technology plans, and © completing the *Statewide Technology Strategies and Initiatives* document. Specifically, these activities provided clear evidence that some major and very important systems implementation projects are not being performed with the degree of success in cost, quality and timeliness expected of such endeavors. One cause of this situation is the agency technology plans indicate that the foundation capabilities in personnel resources and quality assurance practices for accomplishing large, complex projects are inadequate.

Specific Deficiencies

Definitive shortcomings that must be rectified for the state to be able to introduce new and enabling technologies and implement large-scale applications systems more successfully are listed as follows:

1. Lack of quality management practices and procedures, especially the current limited use of standard systems development life cycle methodologies for planning and managing projects.
2. Scarcity of project management expertise and experience necessary to implement large-scale, sophisticated systems.
3. Insufficiency of personnel with the technical skills required to design, install, and maintain applications systems developed using components of modern technologies.
4. Limited senior program management involvement in the planning for and employment of modern technologies to improve significantly the operations of their organizations, particularly the use of technologies to provide more and better services at reduced total costs.
5. Continued use of isolated, agency focused funding mechanisms and developmental approaches for implementing systems when the applications have statewide, multi-agency implications.
6. Lack of adequate planning for data security and disaster recovery.

Recommendations

Unfortunately, the state has reached a position where the situation is of such gravity that the continuance of present practices or the refinement of current procedures will not address adequately the problems and challenges. Accordingly, corrective measures must be far-reaching and dramatic. Specific recommendations are highlighted below:

1. The IRMC must ensure that the leadership of state government is aware of the serious problems and challenges by communicating them in a manner that is clear, concise, and unambiguous.
2. Senior agency management must take a more active role in the overview of technology implementation endeavors. Agencies have tremendous investments in hardware, data and personnel resources, and technology has become an indispensable component in the delivery of services and the performance of business functions. Specifically, agency management must see that:
    - Quality management practices and procedures, including commonly recognized system development life cycle methodologies and software quality engineering, are implemented in a timely manner.
    - Funding is provided for the education and training of technical and program personnel involved in the development and employment of information technology.
    - Projects are staffed with the appropriate number of personnel and staff must possess the necessary project management and technical skills and expertise to complete the work in the assigned time period and with the expected results.
    - The necessary security and disaster recovery safeguards are implemented at the agency level.
3. OSC/IRM staff must:
    - Develop guidelines, provide advice and give assistance to the agencies in developing, implementing, and sustaining quality management programs.
    - Determine a comprehensive curriculum of study and assist in arranging cost-effective instruction for updating the skills and improving the management expertise of technical staff and acquainting program personnel with the necessary awareness of the capabilities and uses of technology for accomplishing business/program objectives.
    - Provide leadership in the state wide project to develop broad-based security capabilities, techniques and procedures, including software resources.
    - Consider the needs for and benefits provided by the establishment of a central source of technical skills, project management experience, and project assessment expertise to facilitate the accomplishment of the design and installation of larger, more technically complex and/or functionally sophisticated applications systems, particularly those implementation

projects involving new technologies and/or having statewide or multi-agency implications.

Statewide Technology Issues

Information Resource
Management Commission

March 7, 1994

Office of the State Controller | Information Resource Management

Some of you may feel uncomfortable with my forthcoming comments. The evidence supporting them is very strong. I do not bring good news, and the answers are neither easy, simple nor inexpensive.

Our situation is pervasive and chronic and it will take time, focused attention and an all inclusive effort to rectify it. Many factors contributed to our getting to this undesirable position, and all of us must assume the responsibility for extracting ourselves from it.

Statewide Technology Issues

Bases for Findings

- 1991- '92 GPAC Study
- Preparation of *Statewide Technology Strategy and Initiatives* document
- Review of agencies' biennial technology plans
- Monthly review of major systems implementation projects

1. The 1991-'92 GPAC study was reviewed for two reasons. First, it provides a reference point, or shapshot, of the situation about two years ago. Second, it serves as a verification of the problems and challenges that have been identified or suspected as a result of other activities performed by the OSC/IRM staff.

2. The development of the *Strategy and Initiatives* document provided a clear vision of the use of technology to make government more responsive to the needs of citizens and more accountable for performance and expenditures.

3. The review of agencies' biennial technology plans offered a revealing insight regarding the efforts and strategies for the deployment and use of technology and the management of technical resources by each of the 23 executive branch agencies.

4. In July 1993, the IRMC approved the procedures and policies for the quality assurance and progress reporting for major systems development projects. We have received reports on about a dozen projects each month. If you turn to tab 8 of your material for this month, you will see that over one-half of the projects merit attention - a first-time event.

Statewide Technology Issues

Fundamental Observation

The state is not prepared to implement satisfactorily either new or conventional technology as a large-scale endeavor on a consistent basis

For a variety of reasons, the state is not prepared to complete successfully, on a consistent basis, large-scale technology projects - either employing older or new technology and whether the work is completed by internal personnel or by external contractors. We simply are not in position to perform with any degree of certainty for success the more complex and involved technology projects described in the Governor's budget under Tab 7 of the meeting material and expected from the major studies (e.g., NCCAN, CJTN and voter registration) nearing completion.

In the past, for some large technology related endeavors, we have been successful. The initial implementation of the NCIH is a prime example. For the present, on an ongoing and consistent basis, this capability does not exist today.

Statewide Technology Issues

Areas Experiencing Improvements

- Appreciation for coordination of systems and work efforts
- Purchasing and procurements
- Initial project reporting
- Communications standards
- Statewide strategy and initiatives

Since the creation of the IRMC, significant progress has been achieved in certain areas. These are listed on this transparency.

Statewide Technology Issues

Areas of Insufficient Progress

- Quality assurance, including systems development/documentation methodology
- Human resource development
  - Upgrading technical skills
  - Improving management/supervisory capabilities
- Disaster recovery for local hardware/software resources and business processes
- Implementation of new and enabling technologies to meet ever-increasing and more complex business and program demands

The first two items on this transparence are necessary prerequisites for any organization to be able to implement technology in a consistently successful manner. These deficiencies were identified repeatedly in the GPAC findings, and we may be in worse shape today regarding them than during the time period of GPAC.

With respect to the last item, governmental organizations, at all levels, must improve their performance dramatically to retain public confidence and increase the satisfaction of citizens for the services provided. The appropriate and innovative use of modern and emerging technology for information management and communications is absolutely essential for the achievement of this objective.

Statewide Technology Issues

Major Contributing Factors

- Inadequate involvement by senior business/program management of agencies in the leadership of the technology area, including:
  - Funding for education and training
  - Project management and oversight of department activities
  - Quality assurance, disaster recovery and security
  - Investments in strategic and modern technology
- Absence of a statewide organization for accomplishing major technology projects

Over the past decade, information technology and telecommunications has clandestinely and insidiously become an increasingly important part of the operations of government. Now, computing has become a strategic resource for state and local governments, with priceless data and expensive hardware, software, and personnel investments. Accordingly, senior managers can not abdicate their responsibilities in this area. More important, they can no longer delegate computing and communications to the technologists.

The second point is a dramatic departure from present practices, and it involves several considerations. The most important is whether the current fragmented structure can provide the critical mass of knowledge, experience and skills and economicies of scale necessary to perform major systems development projects efficiently and reliably, while facilitating the conversion of our technical workforce to the new and enabling technologies.

Statewide Technology Issues

Recommendations

- The leadership of state government must be made aware of the present serious situation
- Senior agency business/program management must take a more active role in the leadership and oversight of technology departments and system implementation projects
- The OSC/IRM staff must provide direction, advice and assistance in critical areas necessary to rectify the problems and address the challenges

The details of these recommendations are presented in the meeting material under Tab. 3.

1. Briefly, senior government officials (not technologists or MIS Directors) must be informed of their responsibilities for exercising the appropriate leadership for the investment, implementation and employment of technology in their agencies and departments. As a result of this increased attention, the directions to, expectations from and roles of the senior agency technical officials may change, probably quite dramatically.

2. Senior agency officials (not just the technologists) must become personally involved in the management and performance of their technical departments or divisions. **The problems presented are more management oriented than technical.**

3. The OSC/IRM staff and SIPS can help, and it will in the area indicated; however, under the present organizational structure for implementing systems, agencies have the ultimate responsibility for the readiness and capabilities of technology staffs to accomplish systems implementation efforts.

APPENDIX D

State of North Carolina Information Resource Management Commission guidelines and Procedures for Resource Acquisition, Periodic Progress (Status) Reporting for Systems Implementation Projects, and Quality Management for systems Implementation Projects

State of North Carolina Information Resources Management Commission Guidelines and Procedures For Resource Acquisition, Periodic Progress (Status) Reporting for Systems Implementation Projects, and Quality Management for Systems Implementation Projects

I. Resource Acquisition

A. Overview Explanation

Resources purchased for implementing technology can involve many forms, including hardware, software, personnel services (especially for unique, esoteric skills or experiences, but often to obtain regular staffing for leveling peaks and valleys of work loads), and consultative services. While many procurements originate as natural outcomes or associations with systems or technology implementation projects, some are initiated as stand-alone, isolated initiatives. In addition, purchase orders, requests for proposals (RFPs), invitation for bids (IFBs), sole source purchases and other practices and documents.

The guidelines and procedures provided in this manual are intended to be congruent with those of the Division of Purchase and Contract of the Department of Administration (P&C). In fact, they follow closely the procedures that have been used on an informal basis over the past few months. The intentions of the guidelines and procedures in this manual are to present a consistency of operations for review, evaluation and approval, while offering the flexibility necessary for accommodating the continually evolving technical, business/program and competitive environment under which we must operate, as well as the unique characteristics of each procurement.

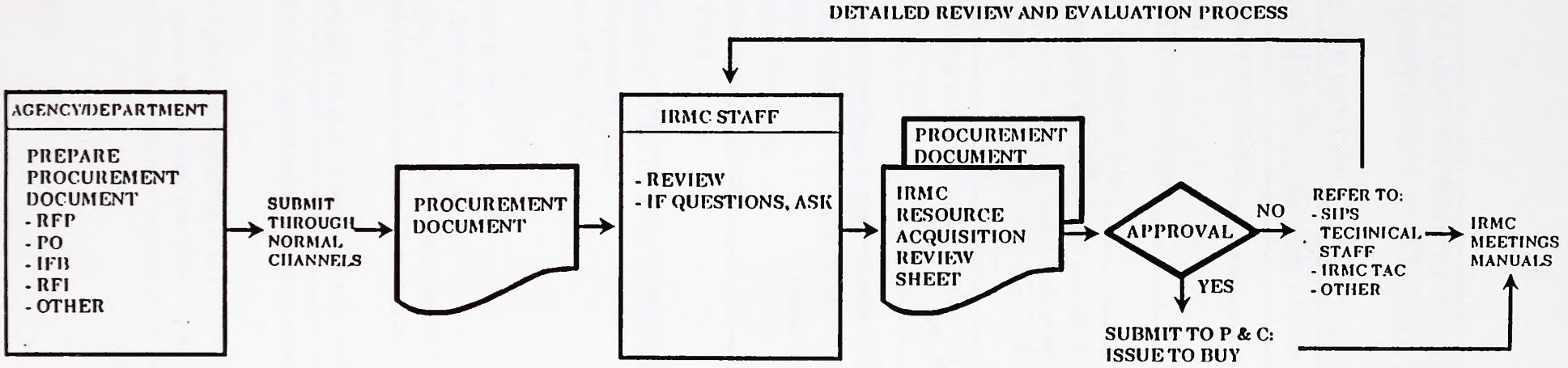
B. Summary of Thresholds

Type of Resource	Threshold	Processing
Hardware and/or Software	Equal to or greater than $10,000	Will be forwarded to IRMC staff for review. Items greater than $2m must be brought before the IRMC. Others may be brought before the IRMC, at the discretion of its staff. If agreement cannot be reached between agency/ departmental personnel and IRMC staff, the Chair of the IRMC will select the appropriate reviewing authority for a decision.

Type of Resource	Threshold	Processing
Consulting and Contractual Services	Equal to or greater then $500,000 - total, long-term purchase so that a procurement is not arbitrarily segmented into separate purchase actions to avoid exceeding a review/reporting threshold. All planning/direction setting projects, regardless of cost or type of contract, must be reviewed. Service agreements/contract renewals are excluded from the IRMC review.	Will be forwarded to the IRMC staff for review. Items equal to or greater than $2m must be brought before the IRMC, at the discretion of its staff. If agreement cannot be reached between agency/ department personnel and IRMC staff, the Chair of the IRMC will select the appropriate reviewing authority for a decision.

NORTH CAROLINA STATE GOVERNMENT

RESOURCE ACQUISITION



STATE OF NORTH CAROLINA
INFORMATION RESOURCE MANAGEMENT COMMISSION

IRMC RESOURCE ACQUISITION REVIEW SHEET

PROJECT IDENTIFICATION:

AGENCY NAME:_____ SUBMITTER'S NAME: _____

SUMMARY OF TYPE OF
ITEMS BEING PURCHASED:_____ DATE SUBMITTED: _____

PURCHASE AMOUNT ($):_____ DATE RECEIVED
(IRMC OFFICE): _____

P & C CONTROL NUMBER: _____

IRMC STAFF CLASSIFICATION:

☐ ***APPROVED*** - Authorized by _____(See comments, if appropriate.)

☐ ***REFERRED*** - (See comments below.)

IRMC STAFF COMMENTS:

REFERRAL INFORMATION:

Referred to the organization(s) listed below for further detailed review, analysis and evaluation.

Resource Acquisition
Examples of Specific Points to Address - Uses as Applicable

Resource Acquisition:

[1] Business/Program Objectives and Benefits: Are the following clearly stated, including:
- A. Objectives
- B. Capabilities
- C. Functions
- D. Features
- E. Results
- F. Benefits (tangible and intangible) including a payback/break-even analysis
  Note: An example of a payback/break-even analysis will be developed.
- G. Business Case - Program/Process Re-engineering

[2] Funding: Is the funding sufficient to accomplish the objectives and deliver the expected benefits and results?

[3] Project Management and Organization: Are the following appropriate and sufficient to accomplish the objectives and deliver the expected benefits and results:
- A. Work plans
- B. Organization Structure
- C. Quality Management Plans
- D. Staffing Plans

[4] Technical Architecture: Is the Technical Architecture congruent with:
- A. Agency/department plans
- B. Directions of the IRMC

[5] Other:
- A. Interconnectivity
- B. Disaster Recovery
- C. For Imaging Systems, Audit Compliance (if financial project) and Historical Record Retention Compliance

II. Periodic Project Progress (Status) Reporting

A. Overview Explanation

The primary objective of project progress reporting is to inform the IRMC, on a regularly scheduled basis, of the overall status and general position of major systems or technology implementation projects over which has overview responsibility per state statutes. This practice

enables the members of the IRMC to monitor, at least on a summary level and at least periodically, the progress of each major systems or technology implementation project as it progresses to completion, and goes into production, with the paramount objectives of finishing on time, within budget and providing the expected business/program results and benefits.

It is envisaged that the preparation of the submission of the periodic project progress report by cognizant personnel of the sponsoring agency/department will follow the normal tasks associated with developing internal weekly or bi-weekly project progress reports. That is, the periodic report is, in many respects, a consolidation and summarization of the internal reports prepared for agency/department management. In fact, the format of the report specified in this manual has been derived from weekly internal reports which have been used by several agencies/departments over the past few years.

To provide consistency of reporting and to facilitate review and evaluation by the members of the IRMC, the reporting outline and the example project GANTT chart (including person time work effort data) given in this section is expected to be followed. Charts produced by other projects management software may be acceptable, as long as they contain the required information in a reasonably similar format. Of course, each project presents particular issues, problems, challenges and opportunities as it progresses through its natural implementation life cycle. Accordingly, agency/department management has considerable discretion in selecting the appropriate items for presentation to the IRMC. The IRMC and agency/department officials have a joint, common interest in ensuring that each project is completed successfully. Agency/department officials, therefore, have a clear responsibility for the accuracy, timeliness and relevancy of information submitted to the IRMC in the periodic project progress report.

B. Summary of Thresholds

Project Size/Characteristics	Processing
Less than $1 million - total, long-term expenditures - and which involves new technology, has statewide implications, represents a situation of unusual risk, or is considered a major systems or technology implementation endeavor	The need for periodic project progress (status) reporting will be determined by the sponsoring agency/department personnel in conjunction with the IRMC staff, the Chair of the IRMC will select the appropriate reviewing authority for a decision
Equal to or greater than $ 1 million (internal plus outside) - total, long-term expenditures - and be considered a major systems or technology implementation endeavor	The need for providing periodic project progress (status) reporting will be determined by the IRMC staff, in conjunction with the sponsoring agency/department. If agreement cannot be reached between agency/department
Equal to or greater than $2 million (internal	

plus outside) - total long-term expenditures - and be considered a major systems or technology implementation endeavor	personnel and IRMC staff, the Chair of the IRMC will select the appropriate reviewing authority for a decision Must provide periodic project (status) reporting

II. Periodic Project Progress (Status) Reporting (continued)

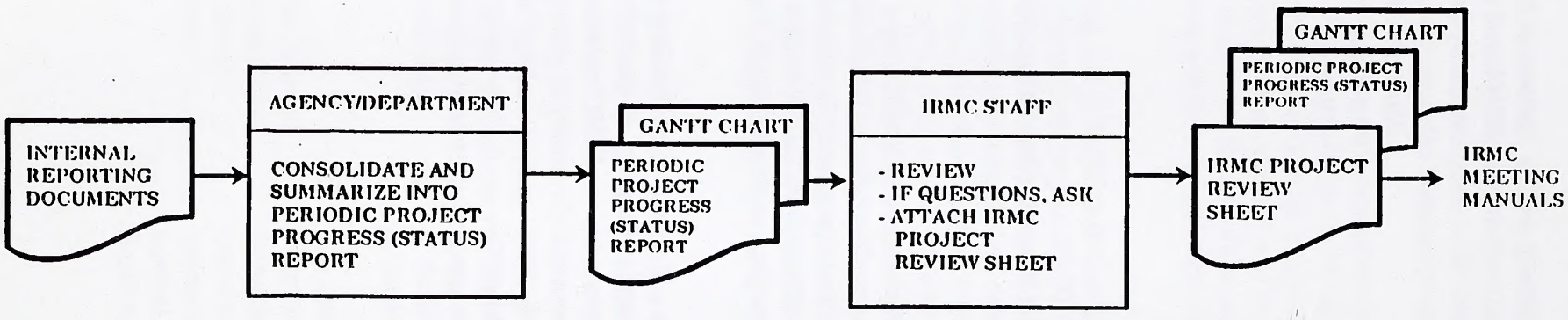
C. Reporting Frequency

The frequency of reporting must be determined by considering a variety of factors, and each project must be evaluated on the merits of its individual situations and circumstance. Complexity, size, exposure to technical and/or business/program risks and duration are some of the elements that must be considered. The intent is to appraise the IRMC in a time frame that allows it to be fully cognizant of the status of each project, while allowing it time to react to potential adverse situations within its purview.

Periodic project progress reports are anticipated to be provided to the IRMC by responsible agencies/departments on either monthly, bi-monthly, or quarterly basis. Project of durations of 12 months or less are expected to be reported to the IRMC monthly or bi-monthly, while projects of longer duration are expected to be reported bi-monthly or quarterly. The reporting frequency for each project will be determined by the IRMC staff, in conjunction with agency/department officials. If agreement cannot be reached between agency/department personnel and IRMC staff, the Chair of the IRMC will select the appropriate reviewing authority for a decision.

NORTH CAROLINA STATE GOVERNMENT

IRMC PROJECT PROGRESS (STATUS) REPORTING



IRMCFLOW

STATE OF NORTH CAROLINA
INFORMATION RESOURCE MANAGEMENT COMMISSION

IRMC PROJECT PROGRESS (STATUS) REVIEW SHEET

PROJECT IDENTIFICATION:

AGENCY NAME: _____ PERIOD COVERED: _____

PROJECT NAME: _____ DATE SUBMITTED: _____

PROJECT SPONSOR: _____ DATE RECEIVED (IRMC OFFICE): _____

IRMC STAFF CLASSIFICATION:

☐ ***EXEMPLARY*** - Project appears to be in excellent shape.

☐ ***ROUTINE*** - No significant issues/problems identified (see comments below.)

☐ ***NEEDS ATTENTION*** - Major actual or potential issues/problems that may impact adversely the progress, costs and/or results (see comments below.)

☐ ***NOT CLASSIFIED*** AT THIS TIME (See comments below.)

IRMC STAFF COMMENTS:

REFERRAL INFORMATION:

Referred to the organization(s) listed below for further detailed review, analysis, and evaluation.

Periodic Project Progress (Status) Report Outline

Agency Name:_____
Project Name:_____
Project Sponsor:_____

Preparer's - Name:_____
Telephone Number:_____
Period Covered:_____

I. **Progress Report Summary:**

Highlight very succinctly the overall status of the project, particularly with respect to its completion on-time, on-budget and delivering the expected results and benefits. Comments should be made regarding actual completion dates versus planned completion dates for major milestone points and major deliverables completed/provided versus planned deliverables. Attach a one-page Project GANTT Chart indicating project status. The GANTT chart must follow the format prescribed for it, including the giving of actual person times (person days or person weeks) versus budget, estimates to complete (person times) and variance (person times) by major project task or segment and or the total project. The planned and actual position of each major project task or segment should be shown graphically by time.

II. **Accomplishments This Period:**

Provide a bullet point summary of key accomplishments or the month organized by active work plan segment.

III. **Issues Requiring Management Attention:**

Provide a bullet point summary of each significant issue that has arisen and its conclusion/resolution, if resolved. Issues should be organized by order of importance.

Each of these issues should be carefully considered to determine the possible impact on the project as a whole, particularly the impact on completing the project on-time, on-budget and delivering the expected results and benefits.

IV. **Plans for Next Period:**

Provide a bullet point summary of significant activities planned for the next period organized by active work plan segment.

V. **Dates of Last and Next Quality Management Review**

Note the date of the project's last Quality Management Review.
Note the date of the project's next expected Quality Management Review.

Periodic Project Progress (Status) F
Example GANTT Chart

(As of 04/30/93)

Task	Budget (Days)	Act (Days)	ETC (Days)	Variance (Days)	% Compl
100 PRE-SITE PHASE	88	22	0	66	100%
200 OPERATIONAL ANALYSIS PHASE	126	189	0	-63	100%
300 DESIGN PHASE					
371 Define HW Requirements (HW Survey)	20	24	3	-7	88%
420 Confirm and Design (AR Parameters)	161	133	10	18	93%
460 Plan Conversion Approach	31	61	17	-46	79%
490 Obtain Management Approval	13	0	0	13	100%
500 IMPLEMENTATION PHASE					
510 Organize Implementation Phase	18	3	0	15	100%
520 Agency Detailed Design					
521 Report Design	49	2	23	24	7%
522 Interface Design	56	0	21	35	0%
523 Conversion Program Design	21	15	19	-13	44%
540 Hardware and Software Installation					
541-3 Install Hardware and Prepare Site (*)	113	0	113	0	0%
545 Install Software - WinView (*)	60	0	20	40	0%
560 Plan System Test	53	3	50	0	5%
570 Procedures/Forms/Training/Security					
571 Develop Business Procedures	123	12	32	78	28%
572 Modify Forms	15	2	30	-17	7%
573 Develop Training Materials	34	58	19	-42	76%
574 Build Training Database	0	16	4	-20	81%
575 Maintain Training Schedule	0	2	5	-7	32%
576 FTE Analysis	0	0	10	-10	0%
578 Train Users	25	5	23	-4	18%
579 Est. Application Security	28	2	26	0	8%
580 Conversion Preparation	41	1	40	0	2%
620 Configuration & Programming					
621 Load Parameters (COA, Parameter Load/Maint)	14	2	18	-7	11%
622 Code Reports	49	0	49	0	0%
623 Code Interfaces	50	6	44	0	13%
624 Code Conv Programs	55	0	55	0	0%
626 Programming & System Test/Tech Support	26	0	26	0	0%
650 Conduct System Test	150	0	150	0	0%
680 Convert Data					
683 L01- Load Vendors	11	108	38	-135	74%
683 L02- Load Items	41	17	40	-13	30%
683 L03-L10 Other data conversion	70	0	70	0	0%
684-8 Production Support	107	0	107	0	0%
690 Post Conversion Review	14	0	14	0	0%
700 Administration	264	225	205	-167	52%
Contingency	135	0	135	0	0%
Total (Excl. Contingency)	2059	1088	1260	-309	46%

Quality Management	Interval
Method/1 Reporting	Weekly
Project Implementation Team	Weekly
Project Management Team	Weekly
DOC Management/Users	Monthly
Internal Checkpoint	(Below △)
External Checkpoint	(Below ▲)
Steering Committee	Periodic

Jan Feb Mar Apr 4/26 5/03 5/10 5/17 5/24 5/31 6/07 6/14 6/21 6/28 7/05 7/12 7/19 7/26

Indicates planned schedule
Indicates percent complete
(*) Indicates that the task needs to be estimated at a lower level of detail to confirm estimates

STATE OF NORTH CAROLINA
INFORMATION RESOURCE MANAGEMENT COMMISSION
GUIDELINES AND PROCEDURES FOR RESOURCE ACQUISITION,
PERIODIC PROGRESS (STATUS) REPORTING FOR SYSTEMS IMPLEMENTATION PROJECTS,
AND QUALITY MANAGEMENT FOR SYSTEMS IMPLEMENTATION PROJECTS

III. Quality Management

A. Overview Explanation

Quality Management applies to the policies, practices and procedures emphasized to ensure major systems or technology implementation projects are completed on time, within budget and the expected business/program results and/or benefits are delivered or achieved. The concept followed in this manual focuses on the building in of quality from the planning of a project through its completion -- quality is a continuous process, not an incremental or occasional activity.

The quality management process involves the identification of a series of checkpoints throughout the project, where detailed reviews are performed and findings are documented and presented to the IRMC. Sample checkpoints are offered in an addendum to this manual (a separate document), and checklists of items normally requiring review and evaluation are given for each of those checkpoints. As each project is unique in many respects, including business/program objectives, technical issues, organizational considerations and political environments, the specific placement of checkpoints within each project's life cycle and the scope and focus of precise items to be reviewed must be determined on a project-by-project basis. The extensive documentation contained in an addendum to this manual (a separate document),provides useful guidelines and examples for performing the tasks of determining checkpoints and specifying items for detailed scrutiny, evaluation and reporting. In fact, if needed, more detailed checklists are included with the systems development life cycle methodology used by many of the large state agencies/departments, and the summary checklists contained in the addendum to this manual are cross-referenced to them.

Project quality management check points and essential items to be reviewed will be determined by sponsoring agency/department personnel, in conjunction with IRMC staff. If agreement cannot be reached between agency/department personnel and IRMC staff, the Chair of the IRMC will select the appropriate reviewing authority for a decision.

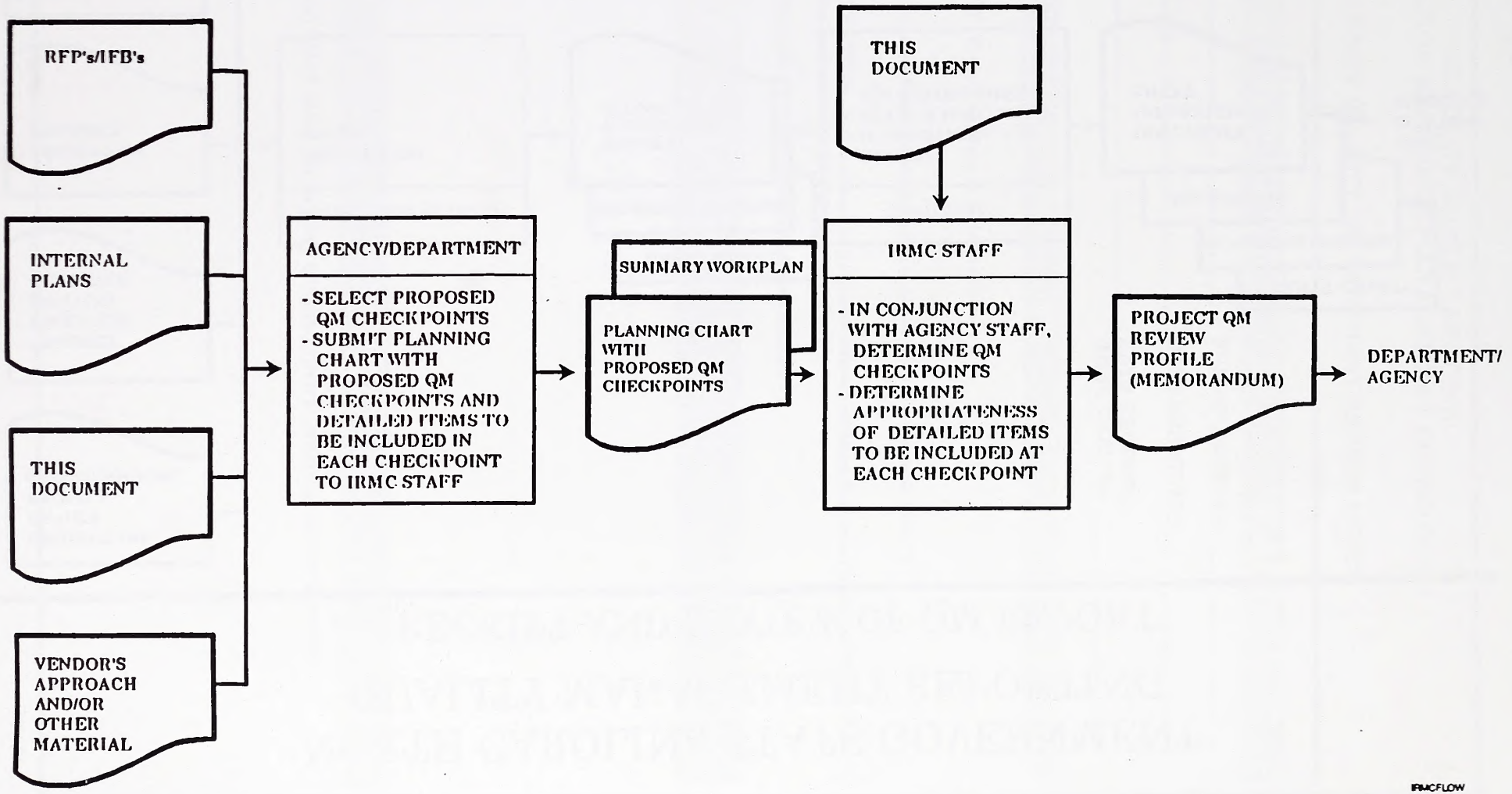
A paramount concept employed in the quality management process is that all reviews will be conducted by knowledgeable, experienced personnel not directly involved in the project. If a project is being conducted and/or managed by an outside organization, contractor personnel may perform the review, if the reviewing personnel are independent of the project. As most major systems or technology implementation projects performed in state government and requiring quality management reporting to the IRMC involve complex issues, it is assumed that agency/department employees and/or IRMC staff will not normally perform these reviews, without outside participation.

B. Summary of Thresholds

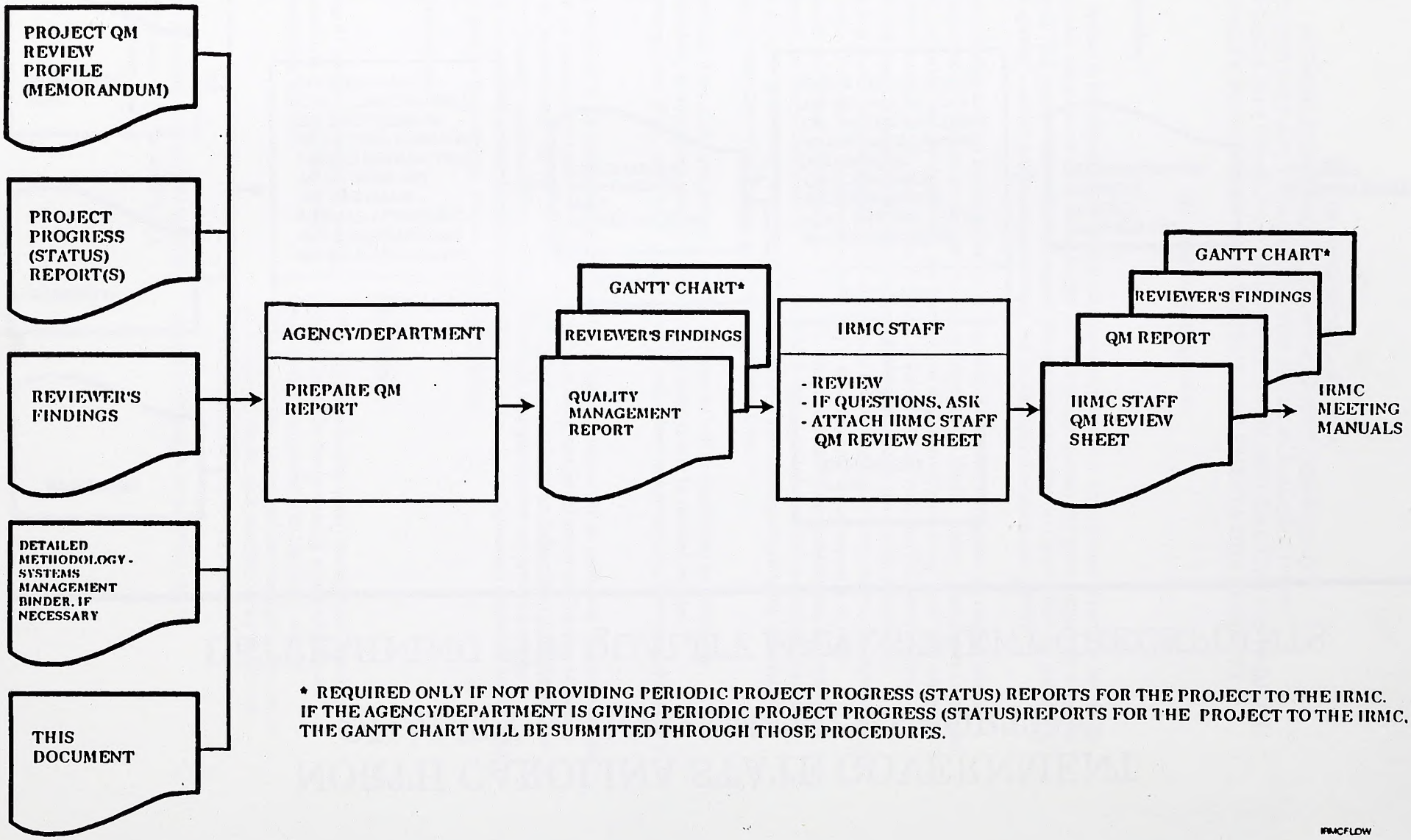
Project Size	Processing
Equal to or greater than $1 million (internal plus outside) -- total, long-term expenditures -- and be considered a major systems implementation endeavor	The need for providing quality management reports will be determined by the sponsoring agency/department personnel in conjunction with the IRMC staff. If agreement cannot be reached between agency/department personnel and IRMC staff, the Chair of the IRMC will select the appropriate reviewing authority for a decision.
Equal to a greater than $2 million (internal plus outside) -- total long-term expenditures -- and be considered a major systems implementation endeavor	Must provide quality management reports.

NORTH CAROLINA STATE GOVERNMENT
QUALITY MANAGEMENT REPORTING

DETERMINING THE QUALITY MANAGEMENT CHECKPOINTS



NORTH CAROLINA STATE GOVERNMENT
QUALITY MANAGEMENT REPORTING
RECEIPT AND REVIEW OF QM REPORT



* REQUIRED ONLY IF NOT PROVIDING PERIODIC PROJECT PROGRESS (STATUS) REPORTS FOR THE PROJECT TO THE IRMC. IF THE AGENCY/DEPARTMENT IS GIVING PERIODIC PROJECT PROGRESS (STATUS)REPORTS FOR THE PROJECT TO THE IRMC, THE GANTT CHART WILL BE SUBMITTED THROUGH THOSE PROCEDURES.

IRMCFLOW

STATE OF NORTH CAROLINA
INFORMATION RESOURCE MANAGEMENT COMMISSION

IRMC STAFF QUALITY MANAGEMENT REVIEW SHEET

PROJECT IDENTIFICATION:

AGENCY NAME: _____ PERIOD COVERED: _____

PROJECT NAME: _____ DATE SUBMITTED: _____

PROJECT SPONSOR: _____ DATE RECEIVED (IRMC OFFICE): _____

IRMC STAFF CLASSIFICATION:

☐ *EXEMPLARY* - Project appears to be in excellent shape.

☐ *ROUTINE* - No significant issues/problems identified (see comments below).

☐ *NEEDS ATTENTION* - Major actual or potential issues/problems that may impact adversely the progress, costs and/or results (see comments below).

☐ *NOT CLASSIFIED* AT THIS TIME (See comments below).

IRMC STAFF COMMENTS:

REFERRAL INFORMATION:

Referred to the organization(s) listed below for further detailed review, analysis and evaluation.

STATE OF NORTH CAROLINA
INFORMATION RESOURCE MANAGEMENT COMMISSION

Quality Management Report Outline

I. Introduction:

- *State agency name, project name, project sponsor, reviewer name, review date, scope of review.*
- *List persons who participated in the review and indicate each's role in the project.*

II. Project Objectives and Background:

- *Provide a brief summary of the overall project's major objectives. Include both business/program and technical objectives. This section should not exceed a paragraph.*
- *Provide a brief summary of the overall project's background including age of the system being replaced, any legislative requirements, and prior phases of the systems development effort.*

III. Business/Program Proposal Overview:

Provide a brief description of the project's progress toward meeting its technical and/or business/program objectives and how the project will satisfy the envisioned benefits. This section should not exceed a paragraph.

IV. Technical Overview:

Provide a brief description of the technical architecture being employed. This section should not exceed a paragraph. Attach an one page technical schematic.

V. Major Areas of Risk or Exposure and Other Major Findings:

For major area of risk or exposure, list the technical, functional, fiscal, operational, political and/or other areas that may adversely impact the successful implementation of this project on-time, within budget and with all expected technical and/or business/program benefits being delivered. Each risk area should include: 1) Risk description, 2) Potential impact on the project, and 3) Management approaches to minimize or eliminate the risk. Attach the Reviewer's Findings.

VI. Outstanding Points from Last Quality Management Review:

List the outstanding points from the last quality management review and how each was or will be resolved.

VII. Project Status:

(This section is required only if the agency/department is not submitting periodic project progress (status) reports for the project to the IRMC.) Provide a brief summary of the overall project's progress in terms of: 1) Total actual person work efforts vs. total budgeted person work efforts; 2) Actual milestone completion dates vs. planned milestone completion dates; 3) Major deliverables completed vs. planned deliverables. The GANTT chart must follow the format prescribed for it under the periodic project progress (status) reporting procedures.

VIII. Next Quality Management Review:

Note anticipated date for next Quality Management Review.

APPENDIX E

Training Matrix

Information Technology Training Matrix

BASIC OFFICE AUTOMATION STANDARDS TRAINING	CLERICAL	CLERICAL-ADVANCED	MGMT/PROFESSIONAL	MGMT - ADMINISTRATIVE	TECHNICAL - BASIC	TECHNICAL-INTERMEDIATE	TECHNICAL - ADVANCED
Windows - 3.1 (Beginning)	X	X	X	X	X	X	X
E -mail software package	X	X	X	X	X	X	X
Word Processing software package	X	X	X	X	X	X	X
Navigating the LAN/Internet	X	X	X	X	X	X	X
Spreadsheet software package	X	X	X	X	X	X	X
OFFICE AUTOMATION SERIES							
Word Processing - Intermediate, Advanced	X	X					
Spreadsheet - Intermediate, Advanced	X	X					
Graphics Series		X					
DATA BASE							
User Specific Database Package			X	X	X	X	X
Smart Stream - Reporting Function				X			
TECHNICAL - COMPUTER APPLICATIONS TRAINING							
Basic Help Desk Trng - Beginning, Intermediate		X			X	X	
PC Troubleshooting		X			X	X	X
3270 Communications					X	X	X
TCPIP					X	X	X
Mainframe Access/Communications					X	X	X
Novell Network Engineer - Series (3 courses)					X	X	X
Certified Novell Network Engineer (2 addt'l courses)						X	X
Programming Language					X	X	X
LAN Troubleshooting					X	X	
Analysis Trng - Beginning, Intermediate, Advanced						X	X
Systems Integration						X	X
Software New Release Training		X			X	X	X
Annual Certification Update Training					X	X	X
SDLC Training							

APPENDIX F

Per Seat Estimate for LAN Installation

Per Seat Estimate for LAN Installation

In order to estimate the cost per seat on an average network in this Department I complied the following information:

All networks must include a minimum of the following items assuming the average network size of 32 users per LAN. This was calculated by taking the number of workstations versus the number of LANs referenced on page 22 of the 12/8/95 draft under LAN Administration. This does not mean that this should be the number of users a LAN Administrator can maintain..

- A LAN Administrator (Computing Consultant III); One LAN Administrator per LAN of average size. With an annual cost of approximately $44,644.00 arrived at by:

    - DEHNR Personnel supplied a list of all 18 Computing Consultant III positions and their salaries from which an average was calculated. The average ended up being $34,106.00.

    - DEHNR Budget supplied a break down of the benefits associated to a position.

Employer contribution to retirement	10.83%
Employer contribution to social security	7.65%
Employer contribution to hospitalization	$1,735.00

    - I estimated an annual training budget of $2,500.00 for each position.

Position	$ 34,106.00
Retirement 10.63%	$ 3,694.00
Social Security 7.65%	$ 2,609.00
Hospitalization	$ 1,735.00
Training	$ 2,500.00
Total	$ 44,644.00

- The LAN hardware:
    - File Server $ 5,000.00
        - Disk Drive $ 1,100.00
        - Network Card $ 90.00 (Ethernet)
        - UPS $ 850.00
        - Tape Drive $ 1,350.00
        - Tapes $ 1,000.00 (20 Tape Std. Rotation)

Total $ 9,390.00

Based on ALR from
State Contract

- Novell Network OS $ 3,188.00
  82.36 Each seat = 17.28 per year Maintenance
- Workstation Each $ 2,000.00 (Including Network Card)
  Average between minimum state standards and Pentium.
- (2) 16 Port Hubs $ 1,808.00
  State Convenience Contract
- Shareable Printer $ 2,500.00
  Network Card $ 247.00 (Ethernet)
  Memory $ 350.00
  Envelope Feeder $ 265.00
  Duplex $ 372.00

  Total $ 3,734.00
  State HP Contract - Model HP 4si.
- Wiring Each Location $ 152.00
  A Recent Installation of 37 locations cost $ 5,635.00.

- Minimum set of software

  - Word processing $ 4,455.00
    State Contract 100.80 Per Seat = 38.44 Per Year Maintenance
    Annual training $ 2,240.00 ($70.00 * 32 Users - One day)
  - Spreadsheet $ 5,616.00
    State contract 144.00 Per Seat = 63.00 2 Year Maintenance
    Annual training $ 2,240.00 ($70.00 * 32 Users - One day)
  - Database $ 2,500.00 (Est. no vendor response)
    Annual training $ 2,240.00 ($70.00 * 32 Users - One day)
  - E-Mail $ 1,152.00
    State Contract 30.00 Per Seat = 12.00 2 Year Maintenance
    Annual training $ 2,240.00 ($70.00 * 32 Users - One day)

  Total $22,683.00

- Summary:

A LAN Administrator (Computing Consultant III)		$ 44,644.00 (1)
File server		$ 9,390.00 (2)
Novell Network OS		$ 3,188.00 (2)
Workstation Each		$ 2,000.00 (2)
(2) 16 Port Hubs		$ 1,808.00 (2)
Shareable Printer		$ 3,734.00 (2)
Wiring Each Location	(Avg)	$ 152.00
Minimum set of software		$ 22,683.00 (1,2)

Total	(Excluding wiring - already averaged)	$ 87,447.00
Average Per Seat Is (including wiring)		**$ 2,884.00**

(1) Re-occurring cost each year. On Software the training portion should be budgeted each year.

(2) These Items should be budgeted for, on a minimum of, every two years to maintain current technology.

APPENDIX G

IRMT Questionnaire and Customer Survey

IRMT Questionnaire and Customer Survey

(1) What is your vision for IT in this Department for the next five years?

(2) What are your current problems in implementing that vision?

(3) If you could change things about our IM system, what would it be and why?

(4) How will your Division change over the next five years?

(5) What hardware/software/human resources do you currently have? (Broad overview, i.e. how many networks, what kind of human resources and how do they communicate?)

(6) What electronic information do you have/maintain?

(7) Do you have a disaster recovery plan in place?

(8) What basic IM functions do you see as essential?

(9) Do you currently own or need a GIS?

(10) Are you willing and able to provide through training for all employees in your Division?

(11) What can you tell us about the services your internal/external customers need from you? Who are your customers specifically?

(12) What is your viewpoint on sharing IT with other Divisions?

(13) Do you currently share IM resources with other agencies?

(14) Does your Division have a proper LAN administrator in place, and can you afford one?

(15) What are your feelings about fees being charged by DCS?

(16) What information capabilities do you think should be in the Divisions, and within the DCS?

(17) What is your perception of the role of DCS?

(18) What support level would you like from the Department?

(19) Is there anything else you would like to share with the IRMT?

Appendix H

Phased Funding Strategy Details

IRMC PROPOSAL
PHASE I

POSITION	F.T.E. NEEDED		P.G.	SALARY NEEDED	SALARY AVAILABLE	SALARY RESERVE NEEDED
CIO	1.00	New	84	$75,000.00	$0.00	$75,000.00
Policy Data Admin.	0.50		80	$21,952.00	$20,493.00	$1,459.00
Policy/Plan Gen.	0.50		80	$21,952.00	$20,493.00	$1,459.00
Admin. Assistant	0.50		61	$9,726.00	$11,066.00	
Clerk Typist V	0.50	New	57	$8,311.00	$0.00	$8,311.00
ITS Director	1.00		82	$48,045.00	$67,252.00	
Admin. Assistant	0.50		61	$9,726.00	$11,066.00	
Clerk Typist III	0.50	New	57	$8,311.00	$0.00	$8,311.00
Senior DBA	1.00		80	$43,904.00	$52,047.00	
Staff DBA	1.00		78	$40,073.00	$34,081.00	$5,992.00
LAN Administrator	1.00		76	$36,563.00	$32,896.00	$3,667.00
Senior WAN/tel.	1.00		78	$40,073.00	$37,146.00	$2,927.00
Wan/telephony	1.00		74	$33,413.00	$33,576.00	
Systems Integrator	1.00		80	$43,904.00	$55,594.00	
Lead LAN Admin.	1.00		80	$43,904.00	$50,482.00	
Trouble Shooter/co.	1.00		78	$40,073.00	$39,324.00	$749.00
Arch/LAN Admin.	2.00		76	$36,563.00	$41,996.00	
			76	$36,563.00	$59,400.00	
Reg. LAN Admin.	7.00		76	$36,563.00	$38,189.00	
			76	$36,563.00	$35,017.00	$1,546.00
			76	$36,563.00	$31,720.00	$4,843.00
			76	$36,563.00	$32,896.00	$3,667.00
			76	$36,563.00	$32,164.00	$4,399.00
			76	$36,563.00	$33,554.00	$3,009.00
			76	$36,563.00	$33,554.00	$3,009.00
Contract Admin.	1.00		74	$33,413.00	$35,093.00	
App.Develop.Mgr.	1.00		81	$45,961.00	$67,491.00	
Project. Mgmt.	2.00		80	$43,904.00	$47,023.00	
			80	$43,904.00	$32,354.00	$11,550.00
Systems Analyst	1.00		78	$40,073.00	$52,832.00	
Systems Analyst	1.00	New	76	$36,563.00	$0.00	$36,563.00
Prog. Analyst	3.00		74	$33,413.00	$27,520.00	$5,893.00
		New	74	$33,413.00	$0.00	$33,413.00
		New	74	$33,413.00	$0.00	$33,413.00
Security/Disaster	1.00		78	$40,073.00	$57,874.00	
Subtotal	**32.00**			**$1,238,127.00**	**$1,124,193.00**	**$249,180.00**
Needed S.S.						$19,062.00
Needed Retirement						$26,986.00
Needed Hosp						$10,416.00
TOTAL	**34.00**			**$1,238,127.00**	**$1,124,193.00**	**$305,644.00**

IRMC PROPOSAL
PHASE II

POSITION	F.T.E. NEEDED	#	P.G.	SALARY NEEDED	SALARY AVAILABLE	SALARY RESERVE NEEDED
Policy/Plan Gen.	1.00	New	80	$43,904	$0	$43,904
Quality Assurance	1.00	New	80	$43,904	$0	$43,904
Senior DBA	1.00	New	80	$43,904	$0	$43,904
Staff DBA	1.00	New	78	$40,073	$0	$40,073
Systems Integrator	1.00	New	80	$43,904	$0	$43,904
Trouble Shooter/co.	1.00	New	78	$40,073	$0	$40,073
Technology Assess.	1.00	New	78	$40,073	$0	$40,073
Contract Admin.	2.00	New	72	$30,623	$0	$30,623
		New	72	$30,623	$0	$30,623
Help Desk Mgr.	1.00	New	78	$40,073	$0	$40,073
Help Desk Staff	6.00	New	67	$24,799	$0	$24,799
		New	67	$24,799	$0	$24,799
		New	67	$24,799	$0	$24,799
		New	67	$24,799	$0	$24,799
		New	67	$24,799	$0	$24,799
		New	67	$24,799	$0	$24,799
	2.00	New	67	$24,799	$0	$24,799
		New	67	$24,799	$0	$24,799
Trng. Coord.	2.00	New	74	$33,413	$0	$33,413
		New	70	$28,168	$0	$28,168
Project Mgr.	3.00	New	80	$43,904	$0	$43,904
		New	80	$43,904	$0	$43,904
		New	80	$43,904	$0	$43,904
Systems Analyst	1.00	New	78	$40,073	$0	$40,073
Tech. Writer	1.00	New	68	$25,841	$0	$25,841
Clerical	1.00	New	59	$17,946	$0	$17,946
Sec./Disaster Rec.	2.00	New	70	$28,168	$0	$28,168
		New	70	$28,168	$0	$28,168
Subtotal	**28.00**			**$929,035.00**	**$0.00**	**$929,035.00**
Needed S.S.						$71,071.00
Needed Retirement						$100,614.00
Needed Hosp.						$48,608.00
TOTAL	**28.00**			**$929,035.00**	**$0.00**	**$1,149,328.00**

IRMC PROPOSAL
PHASE III

POSITION	F.T.E. NEEDED	#	P.G.	SALARY NEEDED	SALARY AVAILABLE	SALARY RESERVE NEEDED
Policy Data Admin.	1.00	New	80	$21,952.00	$0.00	$21,952.00
Quality Assurance	1.00	New	80	$43,904.00	$0.00	$43,904.00
Staff DBA	1.00	New	78	$40,073.00	$0.00	$40,073.00
Data Entry	1.00	New	59	$17,946.00	$0.00	$17,946.00
Systems Analyst	2.00	New	76	$36,563.00	$0.00	$36,563.00
		New	76	$36,563.00	$0.00	$36,563.00
Prog. Analyst	8.00	New	74	$33,413.00	$0.00	$33,413.00
		New	74	$33,413.00	$0.00	$33,413.00
		New	74	$33,413.00	$0.00	$33,413.00
		New	74	$33,413.00	$0.00	$33,413.00
		New	74	$33,413.00	$0.00	$33,413.00
		New	74	$33,413.00	$0.00	$33,413.00
		New	74	$33,413.00	$0.00	$33,413.00
		New	74	$33,413.00	$0.00	$33,413.00
Tech. Writer	1.00	New	68	$25,841.00	$0.00	$25,841.00
Subtotal	**15.00**			**$490,146.00**	**$0.00**	**$490,146.00**
S.S.						$37,496.00
Retirement						$53,083.00
Hospitalization						$26,040.00
Total	**1.00**			**$490,146.00**	**$0.00**	**$606,765.00**

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